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Ciena Corporation
Legal Department
1201 Winterson Road
Linthicum, MD 21090

EXAMINER	
KIM, DAVID S	
ART UNIT	PAPER NUMBER
2633	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)	
	09/550,649	GUERTIN ET AL.	
	Examiner	**Art Unit**	
	David S. Kim	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *24 June 2003* is: a)☐ approved b)☒ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings were received on 24 June 2003. Figs. 1 and 3 are approved. Fig. 2 is disapproved; in optical communication element 112, transmitter TX_N is missing an internal performance monitor 260.

Claim Objections

2. **Claim 5** is objected to because of the following informalities:

In line 16 of claim 5, "below" is used where "greater than" may be intended.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claim 3** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 3 recites that monitoring the signal quality includes a bit parity check that is independent of the bit error rate test signal. Although the specification discusses this bit parity check (specification, pages 11-12), it does not disclose that this bit parity check is **independent** of the bit error rate test signal. The addition of this limitation to claim 3 constitutes an introduction of new matter. No amendment shall introduce new matter into the disclosure of the invention. Please see MPEP 706.03 (o).

5. **Claim 3** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the

specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. There seems to be a limitation that would be difficult to implement without undue experimentation by a person of ordinary skill in the art. Claim 3 recites that monitoring the signal quality includes a bit parity check that is independent of the bit error rate test signal. It is commonly known in the art that a bit parity check is based on the actual bit values (1's and 0's) of the signal being tested. Accordingly, one of ordinary skill in the art would expect the bit parity check to depend on the bit error rate test signal. The specification does not appear to address how said bit parity check is **independent** of the bit error rate test signal. Thus, without further disclosure or clarification, one of ordinary skill in the art would not able to practice the invention without undue experimentation.

Additionally, Applicant comments, "The bit parity check is performed independently of the **testing** of the bit error rate signal" (Paper No. 3, page 15). This comment suggests an inconsistency between the claim language (said bit parity check being independent of the bit error rate signal) and Applicant's intended use of the invention (said bit parity check being independent of the **testing** of the bit error rate signal).

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claim 1** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In last three lines, claim 1 recites, "...to thereby determine which of the *N* optical communication channels **is** greater/less than a specified bit error rate value" (emphasis Examiner's). However, it is generally known in the art that one does not **equate** optical communication channels and bit error rate values. Thus, without further disclosure or

clarification, one of ordinary skill in the art would not able to practice the invention without undue experimentation. Accordingly, this equation renders this claim indefinite.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. **Claims 1 and 2** are rejected under 35 U.S.C. 103(a) as being unpatentable over Waschka, Jr. (U.S. Patent No. 4,449,247).

Regarding claim 1, Waschka, Jr. discloses:

A method (Waschka, Jr., col. 15, line 64- col. 19, line 59) of testing a bit error rate for each of *N* (Waschka, Jr., <u>channel links between stations</u>) optical communication channels having *N* (Waschka, Jr., <u>Figs. 2-3</u>) optical transmitters communicating to *N* optical receivers (Waschka, Jr., <u>Figs. 2-3,</u> optical detector in col. 16, line 14) via *N* communication channels, the method comprising:

cascading (Waschka, Jr., <u>cascaded channel links in Fig. 1</u>, col. 19, lines 25-28) said *N* optical communication channels such that an <u>electrical</u> <u>(Waschka, Jr., Fig. 9)</u> output of an

optical receiver *i* for an optical communication channel *i* is connected to an input of an optical transmitter *i+1* for an optical communication channel *i+1*, for all values of *i* from one to *N*-1, so as to form a continuous cascade of optical transmitter/receiver pairs (Waschka, Jr., col. 19, lines 25-30);

supplying (Waschka, Jr., sequence from sequence generators 173 or 174 in Fig. 8, col. 18, lines 51-56) a bit error rate test signal from a bit error rate tester (Waschka, Jr., bit error rate test unit 22 in Fig. 8) to an input for a first optical transmitter for a first optical communication channel;

supplying (Waschka, Jr., col. 19, lines 3-12) the bit error rate test signal from an output of optical receiver *N* to the bit error rate tester;

detecting (Waschka, Jr., col. 17, lines 14-38) errors in the bit error rate test signal received by the bit error rate tester and calculating therefrom a measured bit error rate (Waschka, Jr., col. 19, lines 9-12); and

comparing (Waschka, Jr., col. 31, lines 3-4) the measured bit error rate with a predetermined system bit error rate threshold;

monitoring (Waschka, Jr., col. 19, lines 30-59, col. 31, lines 5-21) a signal quality for the bit error rate test signal at each of the *N* optical transmitters and *N* optical receivers when the measured bit error rate is greater than the predetermined system bit error rate threshold to thereby determine which of the *N* optical communication channels has greater/less than a specified bit error rate value.

Although Waschka, Jr. does not expressly disclose that communication system is a wavelength division multiplexed (WDM) optical communication system, Waschka, Jr. does disclose a multiplexed system (Waschka, Jr., multiplexers 155 and 156 in Fig. 7). Additionally, WDM systems are extremely well known in the art and it would have been obvious to a person of ordinary skill in the art to implement WDM system techniques in the system of Waschka, Jr.

One of ordinary skill in the art would have been motivated to do so in order to conserve fiber. That is, the system of Waschka, Jr. uses separate fiber links (Waschka, Jr., fiber optic links 17A and 17B in Fig. 1) for bi-directional communications. Using WDM techniques to send the bi-directional communications over a single fiber link would enable one to reduce the required amount of fiber by half.

Waschka, Jr. also does not expressly disclose:

indicating that the bit error rate for each of the *N* optical communication channels is less than a specified bit error rate value when the measured bit error rate is less than or equal to the predetermined system bit error rate threshold.

<u>However</u>, Waschka, Jr. does disclose providing a BER indication for each of the channels when the measured system BER is unacceptable (Waschka, Jr., col. 19, lines 30-42). In the case that the measured system BER is acceptable (the measured bit error rate is less than or equal to the predetermined system bit error threshold), it would be obvious to a person of ordinary skill in the art to set the BER of each of the communication channels to be less than a specified BER, that is, the predetermined system bit error rate threshold. One of ordinary skill in the art would have been motivated to do this in order to keep the system BER less than the predetermined system bit error rate threshold. <u>More exactly, the system BER is the cumulative sum of the channel BER values. Thus,</u> if the BER of each of the communication channels is less than the predetermined system bit error rate threshold, the system BER would be less than that same threshold. <u>Accordingly, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to also include said indicating. One of ordinary skill in the art would have been motivated to do this to show the status of the communication channels, informing maintenance personnel of the BER status of the communication channels.</u>

Regarding claim 2, Waschka, Jr. discloses:

The method of claim 1 (see treatment of claim 1 under Waschka, Jr.), wherein said predetermined system bit error rate is equal to the specified bit error rate for each of N optical communication channels (see treatment of claim 1 under Waschka, Jr.).

11. **Claims 4-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Waschka, Jr. as applied to claims 1 and 2 above, and further in view of Ransford et al. (U.S. Patent No. 6,351,322 B1).

Regarding claim 4, Waschka, Jr. discloses all the limitations of claim 4 except for said monitoring including a bit parity check. However, Ransford et al. teaches a method of testing a bit error rate for optical communication systems that includes a bit parity check (Ransford et al., col. 5, lines 14-52). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the method of Ransford et al. in the method of Waschka, Jr. One of ordinary skill in the art would have been motivated to do this since the method of Ransford et al. would enable one to measure the Q-factor of a system. "The Q-factor is generally considered to be a more useful indicator of the accuracy of a transmission circuit" (Ransford et al., col. 1, lines 60-65). Also, the method of Ransford et al. would also enable one to measure the BER of a system in a "dramatically shorter amount of time" (Ransford et al., col. 2, line 17 – col. 3, line 5).

Waschka, Jr. in view of Ransford et al. still does not expressly disclose:

said monitoring includes monitoring a bit interleave parity for said bit parity check on each electrical signal in the *N* optical transmitter/receiver pairs.

However, Ransford et al. discloses a preference for SONET transmission signals (Ransford et al., col. 5, lines 15-17). Examiner takes Official Notice that SONET transmission signals conventionally include bytes for bit interleave parity monitoring. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include monitoring a bit interleave parity for said bit parity checking. One of ordinary skill in the art

would have been motivated to do this since this function enables error monitoring of SONET transmission signals.

Regarding claim 5, claim 5 is a method claim that corresponds largely to the method claim 4. Therefore, the recited steps in method claim 4 read on the corresponding steps in method claim 5. Claim 5 also includes a limitation absent from claim 4. Waschka, Jr. in view of Ransford et al. also discloses this limitation:

identifying at least one faulty communication channel from said plurality of optical communication channels (Waschka, Jr., col. 5, lines 45-49).

Regarding claim 6, Waschka, Jr. in view of Ransford et al. discloses:

The method of claim 5, further comprising monitoring (Waschka, Jr., col. 19, lines 30-59, col. 31, lines 5-21) a signal quality for the at least one faulty communication channel using an internal performance monitor (Waschka, Jr., BER test circuitry in each station, col. 19, lines 30-33).

Regarding claim 7, Waschka, Jr. in view of Ransford et al. discloses:

The method of claim 6, wherein said internal performance monitor checks a signal transmitted through the at least one faulty communication channel (Waschka, Jr., col. 19, lines 25-42).

Regarding claim 8, Waschka, Jr. in view of Ransford et al. discloses:

The method of claim 5, further comprising passing said bit error rate test signal through said plurality of optical communication channels (Waschka, Jr., channel links between stations, col. 19, lines 18-30).

Regarding claim 9, claim 9 is a system claim that corresponds largely to the method claim 4. Therefore, the recited steps in method claim 4 read on the corresponding means in system claim 9. Claim 9 also includes a limitation absent from claim 4. Waschka, Jr. in view of Ransford et al. also discloses this limitation:

a diagnostic analyzer (Waschka, Jr., alarm units in Figs. 10-11) to analyze diagnostic output signals (Waschka, Jr., col. 5, lines 31-40) from said transmitters and said receivers and to identify (Waschka, Jr., col. 5, lines 40-42) at least one faulty communication channel from said optical transmitter/receiver pairs using a bit parity check (Ransford et al., col. 5, lines 14-52) because said measured bit error rate is greater than said predetermined bit error rate threshold (Waschka, Jr., col. 31, lines 5-21).

Regarding claim 10, Waschka, Jr. in view of Ransford et al. discloses:

The system of claim 8, further comprising an internal performance monitor (Waschka, Jr., BER test circuitry in each station, col. 19, lines 30-33) coupled to said diagnostic analyzer.

Regarding claim 11, Waschka, Jr. in view of Ransford et al. discloses:

The system of claim 9, wherein said internal performance monitor includes an error monitoring unit (Waschka, Jr., Fig. 7, col. 15, line 64 – col. 16, line 4).

12. **Claims 1 and 2** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (U.S. Patent No. 6,229,631 B1) in view of Waschka, Jr.

Regarding claim 1, Sato et al. discloses:

A method (Sato et al., col. 2, lines 40-43) of testing a bit error rate for each of *N* optical communication channels (Sato et al., optical links between each transmitter/receiver 110, repeater 120, other successive repeaters, and the terminal transmitter/receiver along the "UPWARD" direction of optical fiber 100a in Fig. 12) in a wavelength division multiplexed (Sato et al., col. 9, lines 16-18) optical communication system having *N* optical transmitters (Sato et al., E/O converter 113 in transmitter/receiver 110, E/O converter 123b in repeater 120, and other E/O converters in successive repeaters in Fig. 12) communicating to *N* optical receivers (Sato et al., O/E converter 124a in repeater 120, other O/E converters in successive repeaters, and the O/E converter in the terminal transmitter/receiver in Fig. 12) via *N* communication channels, the method comprising:

cascading (Sato et al., note cascaded configuration of the system in Fig. 12) said *N* optical communication channels such that an electrical output (output from O/E converters 124a in repeater 120 and in successive repeaters and in the terminal transmitter/receiver in Fig. 12) of an optical receiver *i* for an optical communication channel *i* is connected to an input of an optical transmitter *i+1* for an optical communication channel *i+1*, for all values of *i* from one to *N-1*, so as to form a continuous cascade of optical transmitter/receiver pairs;

supplying (Sato et al., estimation parameters in col. 6, line 19 – col. 8, line 20; col. 9, line 66 – col. 10, line 43) a bit error rate test signal from a bit error rate tester (Sato et al., workstation 130 in Fig. 12) to an input for a first optical transmitter for a first optical communication channel;

supplying (Sato et al., col. 10, lines 2-6) the bit error rate test signal from an output of optical receiver *N* to the bit error rate tester; and

detecting (Sato et al., col. 8, lines 15-20) errors in the bit error rate test signal received by the bit error rate tester and calculating therefrom a measured bit error rate;

Sato et al. does not expressly disclose:

comparing the measured bit error rate with a predetermined system bit error rate threshold; and

indicating that the bit error rate for each of the *N* optical communication channels is less than a specified bit error rate value when the measured bit error rate is less than or equal to the predetermined system bit error rate threshold; and

monitoring a signal quality for the bit error rate test signal at each of the *N* optical transmitters and *N* optical receivers when the measured bit error rate is greater than the predetermined system bit error rate threshold to thereby determine which of the *N* optical communication channels has greater/less than a specified bit error rate value.

However, Sato et al. does disclose a range of a system margin (Sato et al., col. 2, lines 41-52) related to the bit error rate (Sato et al., col. 6, lines 60-64) and adjusting the system to maintain an optimum operating condition (Sato et al., col. 10, lines 37-43). In determining the bounds of that margin, it is obvious that one bound would be a predetermined system BER threshold. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to compare the measured system BER with the predetermined system BER threshold. One of ordinary skill in the art would have been motivated to do this in order to know if the system of Sato et al. is operating within the range of its system margin. If the result of this comparison indicates that the system is operating outside of this range, recovery measures could be taken to ensure that the system is operating within the range (Sato et al., col. 1, lines 42-46).

Additionally, Waschka, Jr. teaches said monitoring (Waschka, Jr., col. 19, lines 30-59, col. 31, lines 5-21). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the general concept of this monitoring in the method of Sato et al. One of ordinary skill in the art would have been motivated to do this to determine the location of faults along the transmission line (Waschka, Jr., col. 19, lines 38-54; Sato et al., col. 1, lines 33-41).

Moreover, Waschka, Jr. discloses providing a BER indication for each of the channels when the measured system BER is unacceptable (Waschka, Jr., col. 19, lines 30-42). In the case that the measured system BER is acceptable (the measured bit error rate is less than or equal to the predetermined system bit error threshold), it would be obvious to a person of ordinary skill in the art to set the BER of each of the communication channels to be less than a specified BER, that is, the predetermined system bit error rate threshold. One of ordinary skill in the art would have been motivated to do this in order to keep the system BER less than the predetermined system bit error rate threshold. More exactly, the system BER is the cumulative sum of the

channel BER values. Thus, if the BER of each of the communication channels is less than the predetermined system bit error rate threshold, the system BER would be less than that same threshold. Accordingly, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to also include said indicating. One of ordinary skill in the art would have been motivated to do this to show the status of the communication channels, informing maintenance personnel of the BER status of the communication channels.

Regarding claim 2, Sato et al. in view of Waschka, Jr. discloses:

The method of claim 1 (see treatment of claim 1 under Sato et al. in view of Waschka, Jr.), wherein said predetermined system bit error rate is equal to the specified bit error rate for each of N optical communication channels (see treatment of claim 1 under Sato et al. in view of Waschka, Jr.).

13. **Claims 4-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of Waschka, Jr. as applied to claims 1 and 2 above, and further in view of Ransford et al.

Regarding claim 4, Sato et al. in view of Waschka, Jr. discloses all the limitations of claim 4 except for said monitoring including a bit parity check. However, Ransford et al. teaches a method of testing a bit error rate for optical communication systems that includes a bit parity check (Ransford et al., col. 5, lines 14-52). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the method of Ransford et al. in the method of Sato et al. in view of Waschka, Jr. One of ordinary skill in the art would have been motivated to do this since the method of Ransford et al. would enable one to measure the BER of a system in a "dramatically shorter amount of time" (Ransford et al., col. 2, line 17 – col. 3, line 5).

Sato et al. in view of Waschka, Jr., further in view of Ransford et al., still does not expressly disclose:

said monitoring includes monitoring a bit interleave parity for said bit parity check on each electrical signal in the *N* optical transmitter/receiver pairs.

However, Ransford et al. discloses a preference for SONET transmission signals (Ransford et al., col. 5, lines 15-17). Examiner takes Official Notice that SONET transmission signals conventionally include bytes for bit interleave parity monitoring. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include monitoring a bit interleave parity for said bit parity checking. One of ordinary skill in the art would have been motivated to do this since this function enables error monitoring of SONET transmission signals.

Regarding claim 5, claim 5 is a method claim that corresponds largely to the method claim 4. Therefore, the recited steps in method claim 4 read on the corresponding steps in method claim 5. Claim 5 also includes a limitation absent from claim 4. Sato et al. in view of Waschka, Jr., further in view of Ransford et al., also discloses this limitation:

identifying at least one faulty communication channel from said plurality of optical communication channels (Waschka, Jr., col. 5, lines 45-49).

Regarding claim 6, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The method of claim 5, further comprising monitoring (Waschka, Jr., col. 19, lines 30-59, col. 31, lines 5-21) a signal quality for the at least one faulty communication channel using an internal performance monitor (Sato et al., controllers 116 and 126 in each transmitter/receiver and repeater in Fig. 12 incorporating the monitoring concept of Waschka, Jr., BER test circuitry in each station, col. 19, lines 30-33).

Regarding claim 7, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The method of claim 6, wherein said internal performance monitor checks a signal transmitted through the at least one faulty communication channel (Sato et al., controllers 116 and 126 in each transmitter/receiver and repeater in Fig. 12 incorporating the monitoring concept of Waschka, Jr., col. 19, lines 25-42).

Regarding claim 8, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The method of claim 5, further comprising passing said bit error rate test signal through said plurality of optical communication channels (Sato et al., optical links between each transmitter/receiver 110, repeater 120, other successive repeaters, and the terminal transmitter/receiver along the "UPWARD" direction of optical fiber 100a in Fig. 12 incorporating the concept of Waschka, Jr., channel links between stations, col. 19, lines 18-30).

Regarding claim 9, claim 9 is a system claim that corresponds largely to the method claim 4. Therefore, the recited steps in method claim 4 read on the corresponding means in system claim 9. Claim 9 also includes a limitation absent from claim 4. Sato et al. in view of Waschka, Jr., further in view of Ransford et al., also discloses this limitation:

a diagnostic analyzer (Sato et al., workstation 130 in Fig. 12, col. 10, lines 2-6 incorporating the concept of Waschka, Jr., alarm units in Figs. 10-11) to analyze diagnostic output signals (Waschka, Jr., col. 5, lines 31-40) from said transmitters and said receivers and to identify (Waschka, Jr., col. 5, lines 40-42) at least one faulty communication channel from said optical transmitter/receiver pairs using a bit parity check (Ransford et al., col. 5, lines 14-52) because said measured bit error rate is greater than said predetermined bit error rate threshold (Waschka, Jr., col. 31, lines 5-21).

Regarding claim 10, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The system of claim 8, further comprising an internal performance monitor (Sato et al., controllers 116 and 126 in each transmitter/receiver and repeater in Fig. 12 incorporating the monitoring concept of Waschka, Jr., BER test circuitry in each station, col. 19, lines 30-33) coupled to said diagnostic analyzer.

Regarding claim 11, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The system of claim 9, wherein said internal performance monitor includes an error monitoring unit (Sato et al., controllers 116 and 126 in each transmitter/receiver and repeater in Fig. 12 incorporating the monitoring concept of Waschka, Jr., Fig. 7, col. 15, line 64 – col. 16, line 4).

Response to Arguments

14. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection. Additionally, Examiner addresses key points of Applicant's arguments in detail.

Applicant presents four points about the rejections under Waschka, Jr. as the primary reference:

a. "Specifically, Waschka, Jr., does not disclose or suggest cascading the N optical communication channels so as to form a continuous cascade of optical transmitter/receiver pairs" (Paper No. 3, page 17).

b. "Specifically, Waschka, Jr., does not disclose monitoring a signal quality...when the measured bit error rate is greater than the predetermined system bit error rate threshold" (Paper No. 3, page 18).

c. "Waschka, Jr. also does not disclose or suggest monitoring each transmitter/receiver pair to determine which is greater/less than a specified bit error rate value. Further, the operator selectively interrogates the control units, whereas claim

1 recites monitoring the signal quality for the bit error rate test signal at each transmitter and receiver" (Paper No. 3, page 18).

d. Applicant disagrees with the inherency argument applied in Paper No. 2 (Paper No. 3, pages 18-20).

Regarding the first point, Examiner respectfully disagrees. Waschka, Jr. discloses an optical communication channel (Waschka, Jr., channel links between stations) between an optical transmitter (Waschka, Jr., optical transmission equipment in Figs. 2-3) and an optical receiver (Waschka, Jr., optical detector in col. 16, line 14), forming a transmitter/receiver pair. These pairs are cascaded from station to station.

Regarding the second point, Examiner respectfully disagrees. Waschka, Jr. discloses a determination that a measured bit error rate is greater than a predetermined system bit error rate (Waschka, Jr., col. 19, lines 30-59, col. 31, lines 5-21), the "when" of Applicant's second point. In response to this determination, a signal quality for the bit error rate test signal is monitored.

Regarding the third point, Examiner respectfully disagrees. According to the description of a transmitter/receiver pair given above, each pair is monitored *through* the control units. These units are part of each transmitter and receiver. Thus, signal quality for the bit error rate test signal is monitored at each transmitter and receiver.

Regarding the fourth point, it is moot in view of the new grounds of rejection. The new grounds of rejection lack arguments based on inherency.

Applicant also presents six points about the rejections under Sato et al. as the primary reference.

e. Applicant disagrees with the inherency argument applied in Paper No. 2 (Paper No. 3, pages 21-22).

f. "Sato also does not disclose or suggest cascading the N optical communication channels so as to form a continuous cascade of optical transmitter/receiver pairs" (Paper No. 3, page 22).

g. "[T]he Office Action fails to provide any evidence of a motivation to modify Sato to achieve Applicants claimed embodiments...Sato does not disclose or suggest isolating communication channels to determine which optical communication channel is faulty using a BER test in conjunction with monitoring a signal quality to determine which communication channel is greater/less than a specified bit-error rate value. Thus, the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose" (Paper No. 3, pages 22-23).

h. "Specifically, Sato does not disclose monitoring a signal quality for the bit error rate test signal at each of the N optical transmitters and N optical receivers when the measured bit error rate is greater than the predetermined system bit error rate threshold. The system of Sato does not disclose or suggest monitoring the signal quality after a predetermined condition...Further, as noted above, Sato does not determine which optical communication channel is greater or less than a specified bit error rate value" (Paper No. 3, page 23).

i. "Waschka, Jr. fails to disclose or suggest all the features of claim 1. Thus, the combined patents would not disclose or suggest all the claimed features" (Paper No. 3, page 23).

j. "Sato does not disclose or suggest isolating faults along transmission lines. In fact, it is unclear to Applicants how the system of Sato would operate in conjunction with Waschka, Jr....Applicants maintain that the combination of the cited patents would change the principal of operations for each patent" (Paper No. 3, page 24).

Regarding the first point, it is moot in view of the new grounds of rejection. The new grounds of rejection lack arguments based on inherency.

Regarding the second point, Examiner respectfully disagrees. Sato et al. discloses an optical communication channel (Sato et al., optical links between each transmitter/receiver 110, repeater 120, other successive repeaters, and the terminal transmitter/receiver along the "UPWARD" direction of optical fiber 100a in Fig. 12) between an optical transmitter (Sato et al., E/O converter 113 in transmitter/receiver 110, E/O converter 123b in repeater 120, and other E/O converters in successive repeaters in Fig. 12) and an optical receiver (Sato et al., O/E converter 124a in repeater 120, other O/E converters in successive repeaters, and the O/E converter in the terminal transmitter/receiver in Fig. 12), forming a transmitter/receiver pair. These pairs are cascaded from transmitter/receiver to repeater to successive repeaters to the terminal transmitter/receiver in Fig. 12.

Regarding the third point, it is moot in view of the new grounds of rejection.

Regarding the fourth point, it is moot in view of the new grounds of rejection.

Regarding the fifth point, Examiner respectfully disagrees. As discussed above, Waschka, Jr. discloses or suggests all the features of claim 1. Thus, the combined patents would disclose or suggest all the claimed features.

Regarding the sixth point, Examiner respectfully disagrees. The principal of operation of Sato et al. focuses on the objective of **optimizing transmission quality** in an optical transmission system at all times, regardless of the operating conditions of the individual components in the system (Sato et al., abstract, col. 30, lines 3-14), so that it is not always required to establish an auxiliary line in addition to the main transmission line (Sato et al., col. 2, lines 50-52). The principal of operation of the incorporated teachings of Waschka, Jr. focuses on the objective of providing a detailed method for **fault isolation**. Sato et al. and Waschka, Jr. both teach the determination of BER values. Sato et al. and Waschka, Jr. both teach fault

isolation. The incorporation of Waschka, Jr. would not adversely interfere or impair the principal of operation of Sato et al.; rather, the detailed teachings of Waschka, Jr. would enhance the broad fault isolation teachings of Sato et al. (Sato et al., col. 1, lines 33-41). The thrust of this enhancement of Waschka, Jr. is separate from the principal of operation of Sato et al.

Summarily, in view of the treatment of Applicant's arguments above, the respective portions of Applicant's arguments are moot and unpersuasive. Thus, Examiner respectfully maintains the standing rejections.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chum is cited to show a related method of monitoring BER to isolate faulty communication channels. Noser and Bullock et al. are cited to show related apparatuses that can be used in a WDM optical communication system for forming a continuous cascade of optical transmitter/receiver pairs and to show apparatuses that monitor a bit interleave parity for a bit parity check. Barnard et al. is cited to show a related internal performance monitor. Butler et al. is cited to show a related bit error rate tester.

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 703-305-6457. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

DSK

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600